PROVINCE OF BRITISH COLUMBIA.

DEPARTMENT OF AGRICULTURE
(LIVE STOCK BRANCH)

PRACTICAL POULTRY-RAISING

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Hon. W. J. Bowser,
Minister of Agriculture,
Victoria, B.C.

Sir,—I have the honour to submit for your approval the 5th edition of Bulletin No. 26, as revised by J. R. Terry, Chief Poultry Instructor, containing practical information on the care and management of poultry.

I have the honour to be,
Sir,
Your obedient servant,

WM. E. SCOTT,
Deputy Minister of Agriculture.

Victoria, B.C., September, 1915.

PROVINCE OF BRITISH COLUMBIA.

DEPARTMENT OF AGRICULTURE (LIVE STOCK BRANCH).

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Fig. 1. Feeding growing stock. "The man behind the feed-pail" is an important factor in the successful management [illegible] poultry.

PRACTICAL POULTRY-RAISING.

By J. R. Terry, Chief Poultry Instructor.

THE business of poultry-raising is one of the most attractive pursuits of all the agricultural industries. More than ever the poultry industry is being regarded as a national industry. The product of the domestic hen is demanded more than any other product of agricultural or animal industry, with the exception of milk and flour. There is a constant and increasing demand particularly for the fresh egg, and within the past few years the number marketed, and consumed, has increased tremendously. Few departments of agricultural industry offer greater returns on equal capital invested to those who work diligently and consistently. The hen to-day may be considered the most profitable condenser of the raw materials of the land into a finished product. In other words, the egg is manufactured at less cost to the country than almost any other staple food product.

Any farm is improved by a poultry department, and few businesses can be operated in as wide a range of climate and in as varied conditions. Poultry-raising, then, is more independent than almost any other business and few branches can be carried on with as inexpensive an outlay. The returns on the money invested in a poultry plant are immediate and regular.

It is the purpose of the author to present in this bulletin such information as may be followed by the poultryman with his small or large flock. No hard-and-fast rules are laid down, since it is a matter of record that no one method can be described which will prove adequate and suitable under all conditions with which the poultryman on a small or large scale may be confronted. Through emphasis of the general underlying principles in raising poultry the reader is left to exercise individual judgment in applying the principles to his own particular conditions.

THE POULTRY INDUSTRY.

Until recently very little attention has been given to poultry-raising in this Province, the industry having been largely considered as a side-issue of but little importance. The attention of the rural community has been absorbed almost entirely in fruit-growing and dairying. These are the two leading industries of the Province but it is surprising how the poultry industry has been neglected when the proportional values of horticultural dairy, and poultry products are compared.

Poultry husbandry, then, is seen to be deserving of more attention than it has received in the past.

POULTRY AND MIXED HUSBANDRY

The system of mixed farming as carried on in Canada is ideal for the rearing of poultry. In some of the Provinces, especially Ontario, encouragement is given to general farmers to keep a few fowls on each farm. The establishment of exclusive poultry plants is not encouraged. In this Province, because of our highly specialized industries and because of other conditions, we find that the keeping of fowls in large numbers is a good investment, when combined with expert knowledge, favourable surroundings, and intelligence. A few poultry plants, where eggs and other poultry produce form the basis of returns, are quite successful. Conditions seem to allow of intensive specialization. At the same time it must not be forgotten that excellent profits are possible on farms of mixed husbandry. The returns from the flock should add materially to the income of the fruit-grower, the dairyman, or even the man who is merely in the process of clearing his land. The orchard makes an admirable run for poultry, especially growing stock, as does also the cattle-yard. In the orchard, many insect pests will be destroyed and the manure from the fowls will greatly enrich the soil. By-products in the orchard and in the fields are converted into profit. Fowls are economizers, and when a poultry department is carried on with other branches of farming a system of rotation could be adopted.

THE MARKET.

Poultry produce finds a more ready sale with better prices on our home markets than elsewhere in Canada. There is no market like the "home" market, but in the past it has been largely supplied by poultrymen of the Far East and South. During 1914 there was imported 1,025,827 dollars' worth of poultry produce from the Eastern Provinces, as well as 723,718 dollars' worth of produce from outside Canada. The importations of produce in 1914 amounted to $1,749,545. A study of these figures is convincing that British Columbia is annually losing enormous sums of money. Such a condition is most undesirable, especially when we consider the adaptability of the Province for increased production.

In 1906 the average price paid per dozen for eggs was 25 cents.
In 1907 the average price was 30 cents.
In 1908 the average price was 35 cents.
In 1909 the average price was 37 cents.
In 1910 the average price was 45 cents.
In 1911 the average price was 40 cents.
In 1912 the average price was 38 cents.
In 1913 the average price was 35 cents.
In 1914 the average price was 35 cents.

THE CLIMATE.

The poultry industry is more independent of climate than other branches of agriculture. The climate of the Province as a whole is quite favourable. Some sections of the Province have slight advantages in climate over other sections, but the average temperature is not low. Climatic conditions are such that fowls may be kept under the most natural conditions and therefore the best. This means healthier flocks with less cost in maintaining than in other parts of Canada where artificial methods must be adopted.

THE SOIL.

The nature of the soil is a more important factor than many poultrymen realize. The soil need not be very fertile, but above all it should be clean. A sandy soil suits best, but it should be able to grow a sufficient amount of green food. Loams and clays will often grow abundance of green food, but are sometimes difficult to drain. Then they are apt to become contaminated and this is one thing that poultrymen must avoid. Considering our comparatively moist climate in some parts of the Province, the question of soil-contamination becomes one of our most important problems. The runs and yards should be kept sweet and clean by frequent ploughing and sowing down to some form of green food. Land that is well drained and porous should be selected if possible. Danger of soil-contamination must be avoided. On a soil of a porous nature the droppings are deodorized by absorption of their liquids, and the rains wash a large proportion of the remaining solids below the surface. This tends to prevent contamination, and disease is kept down; whereas in a very heavy clay soil, especially where the top soil tends to bake, the surface soon becomes foul and outbreaks of disease occur. If possible, enough land should be secured so that not more than 300 fowls be placed on an acre. Adult birds should be given double yards, so that green food is growing in one run while the fowls are in the other.

It is not advisable to start a poultry-ranch devoted to poultry production only on less than 10 acres. Where from 500 to 800 head of layers are kept on this acreage, the growing stock can be provided with free range. Chicks so raised can be grown much cheaper, with less mortality, than chicks reared on restricted range.

A preferable site is on a gentle slope facing south or south-east. Such an exposure admits of the greatest amount of sunlight, which is an important factor in the rearing of poultry.

THE BREEDS.

Of the many breeds of poultry, only the more popular commercial varieties can be given here.

PLYMOUTH ROCKS.—The most popular varieties of this breed are the Barred, White, and Buff. The Barred Plymouth Rock is the oldest of the three varieties. All three varieties are noted for their qualities as general-purpose fowls, being excellent flesh producers and good layers. They have single combs, yellow legs and flesh, are fairly hardy, and layers of brown or tinted eggs.

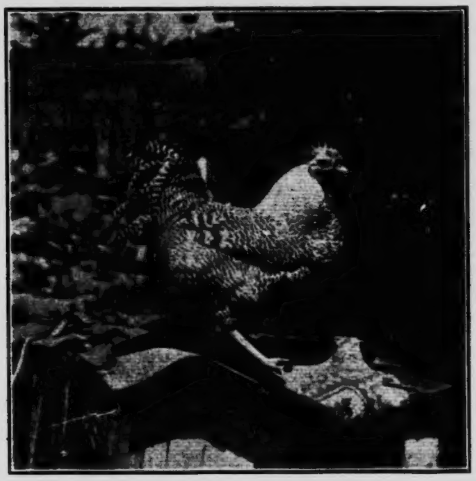

Fig. 2. Barred Plymouth Rock.

The standard-weights are: Cock, 9½ lb.; cockerel, 8 lb.; hen, 7½ lb.; and pullet, 6½ lb.

WYANDOTTES.—There are several varieties of this breed, including the Silver, Golden, White, Buff, Black, Partridge, Silver Pencilled, and Columbian. The last variety is the newest of all, while the White is the most popular. The Wyandottes bear the same general characteristics, from a commercial standpoint, as the Plymouth Rocks. They have rose combs and possess a different shape. The White Wyandotte is bred by many market poultrymen.

The standard weights are: Cock, 8½ lb.; cockerel, 7½ lb.; hen, 6½ lb.; and pullet, 5½ lb.

RHODE ISLAND RED.—The only two varieties of this breed are the Single and Rose Comb and they have no material differences except in combs. Although a breed of comparatively recent origin, the Rhode Island Red is quite popular as a utility fowl. As with all American breeds, the Reds have yellow flesh and legs, and lay brown or tinted eggs.

The standard weights are: Cock, 8½ lb.; cockerel, 7½ lb.; hen, 6½ lb.; and pullet, 5 lb.

ORPINGTONS.—The most popular varieties of this breed are the Buff, Black, and White, the Buff being the favourite.

They are hardy, good layers, and flesh well for the market; having a white skin. They are single combed, and lay brown or tinted eggs.

The standard weights are: Cock, 10 lb.; cockerel, 8½ lb.; hen, 8 lb.; and pullet, 7 lb.

LEGHORNS.—This breed composes a group characterized by great activity and sprightliness. The most popular varieties are the Single-comb White, Brown, and Buff, while the Rose-comb varieties receive favour in some parts. The Single-comb White Leghorn is the most numerous fowl in the Province.

All Leghorns are essentially egg breeds, the egg being white in colour. The young cockerels make splendid squab broilers and broilers.

MINORCAS.—The Single-comb Black is the most popular variety. The Minorcas have much of the same characteristics of the Leghorns, except that they are larger, have larger combs, and lay larger eggs.

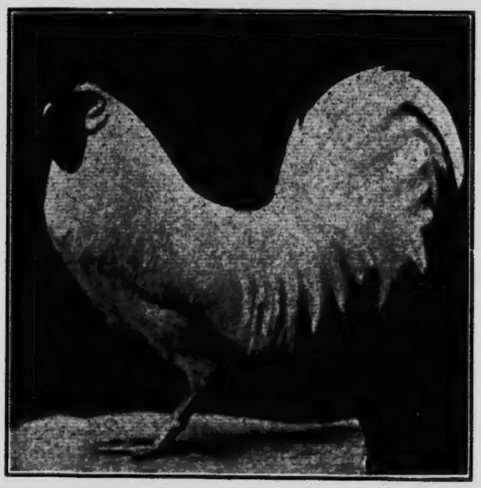

Fig. 3. Single-comb White Leghorn.

The standard weights for the Single-comb Black Minorca are: Cock, 9 lb.; cockerel, 7½ lb.; hen, 7½ lb.; and pullet, 6½ lb.

GAMES.—The Indian Game is the chief variety of interest to the farmer. They are a good meat fowl, having short, thick legs, large thighs, a deep and broad breast, and are yellow flesh. However, they are very poor layers generally.

The standard weights are: Cock, 9 lb.; cockerel, 7½ lb.; hen, 6½ lb.; and pullet, 5½ lb.

BRONZE TURKEYS.—The Bronze turkey is the largest of all varieties and is also the most popular. They are hardy, good foragers, and dress a good proportion of flesh.

The standard weights are: Adult cock, 36 lb.; yearling cock, 33 lb.; cockerel, 25 lb.; hen, 20 lb.; and pullet, 16 lb.

PEKIN DUCKS.—The marketable value as table poultry has made the Pekin duck a favourite with the majority of duck-breeders. In "the making of the duck industry of America" the Pekin was used almost exclusively, and its popularity is exceeded by no other variety, because of its utilitarian qualities. As rapid producers of flesh and good layers they are unexcelled.

The standard weights are: Adult drake, 8 lb.; young drake, 7 lb.; adult duck, 7 lb.; and young duck, 6 lb.

ROUEN DUCKS.—The Rouen is quite hardy, of large size, and dresses well for the table.

The standard weights are: Adult drake, 9 lb.; young drake, 8 lb.; adult duck, 8 lb.; and young duck, 7 lb.

BUFF ORPINGTON DUCKS.—A variety of ducks that are of medium weight and excellent layers. They are becoming popular. Weights: Drake, 7 lb.; duck, 6 lb.

INDIAN RUNNER DUCKS.—The variety is noted for its peculiar shape and for its productivity. They are splendid layers of white transparent eggs, but are too small to be classed as a meat fowl.

Fig. 4. Farm scene in British Columbia. A pretty rural scene, although the picture reveals a method of poultry-keeping that is not wise to follow. Turkeys should be reared away from all buildings or surroundings over which ordinary fowls roam Filth and successful turkey-raising will not combine. Sooner or later "black-head will follow, and once it makes its appearance, turkey-raising generally has to be discontinued owing to its ravages.

The standard weights are: Drake, 4½ lb., and duck, 4 lb.

TOULOUSE GEESE.—There is very little difference between the Toulouse and Embden geese as far as weight is concerned, both being classed as the heavyweights of the goose family. The plumage is grey and white. The Toulouse are generally better layers, but not such good setters as the Embden.

The standard weights are: Adult gander, 20 lb.; young gander, 18 lb.; adult goose, 18 lb.; and young goose, 15 lb.

EMBDEN GEESE.—Having white plumage, the Embden is sometimes preferred for the white feathers, feathers being an important item in goose-culture.

The standard weights are: Adult gander, 20 lb.; young gander, 18 lb.; adult goose, 18 lb.; and young goose, 16 lb.

STARTING IN BUSINESS.

To the man who wishes to make a business of poultry-raising, to raise superior birds from a commercial standpoint, British Columbia offers inducements such as few other Provinces in the Dominion. There is room for great development. There is a large and stable home market, which is expanding very rapidly. Markets are opening up in the North, and Alaska also has a market which British Columbia should be supplying. The supply is not nearly keeping pace with the constant and increasing demand. In fact, British Columbia, in poultry produce at least, should be an exporter rather than an importer.

Fig. 5. Colony brooder where "round" hover is used.

Profits are not dependent entirely upon market prices; when markets are good the egg yield also should be good. It is essential to start with the best strains of some of the commercial breeds. Strain and stamina have probably more to do with the success than breed. Also for those who intend taking up poultry-raising, some experience is necessary before launching out; without experience the importance of the details of the business will not be realized and success is almost impossible. This one fact must be borne in mind, that successful poultry-keeping depends upon the regular and accurate performance of many small tasks.

INCUBATION.

Since the principles of incubation and brooding have been dealt with at length in Bulletin No. 39, only a few of the more important points will be discussed here.

Both natural and artificial means of incubation are practised the world over. On small farms where only a few fowls are kept the buying of an incubator would not be justified. Here the chicks are hatched by hens altogether. On large plants where extensive methods are employed incubators must be used. The degree of success in artificial incubation depends to some extent upon the machine selected to do the work; therefore care should be exercised in making the selection. Nearly all of the different machines used are constructed on similar principles, and there is little difference in the hatching power of the hot-air incubator as compared with the hot-water make. Both makes are giving good satisfaction in the Province. Whatever machine is purchased, it should be a good one. A low-grade, cheap machine should never be experimented with. The purchase of the best machine on the market is the best investment in the long run.

The best place for an incubator is one where there are no draughts of air, and yet where the air of the room is pure at all times. It is desirable to have an even temperature in the room, although throughout the greater part of the Province such precautions need not be taken as in the East, since the climatic conditions at hatching time are not as changeable. Incubator-houses which give best results are usually those built half in the ground and half out. The best cellar is one with a 5- or 6-foot basement with the rest of the house above ground. Cement is often used in the construction of the basement of the house.

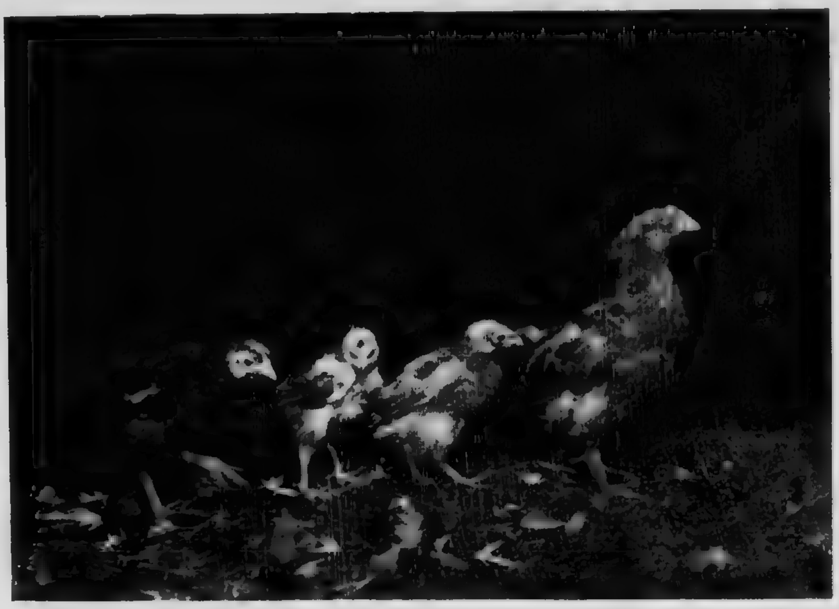

Fig. 6. Chicks of the same age. An illustration of what sometimes happens when pullets' eggs are used for hatching; eggs from forced stock; inbred fowls; lice-infested chicks; improperly fed or improperly housed breeding stock.

The eggs require to be turned often, twice daily being generally found sufficient. Usually two tests are made, on the seventh and sixteenth day. It is generally advisable to supply moisture during incubation. The object of supplying moisture is to prevent the eggs from losing too much weight. Many full-formed chicks die in the shell because of lack of moisture. The chicks are weak and the shells are very hard, consequently the little chicks are unable to force their way out.

At hatching-time the incubator chamber should be kept dark. The chicks should not be removed from the incubator until about thirty-six hours after hatching

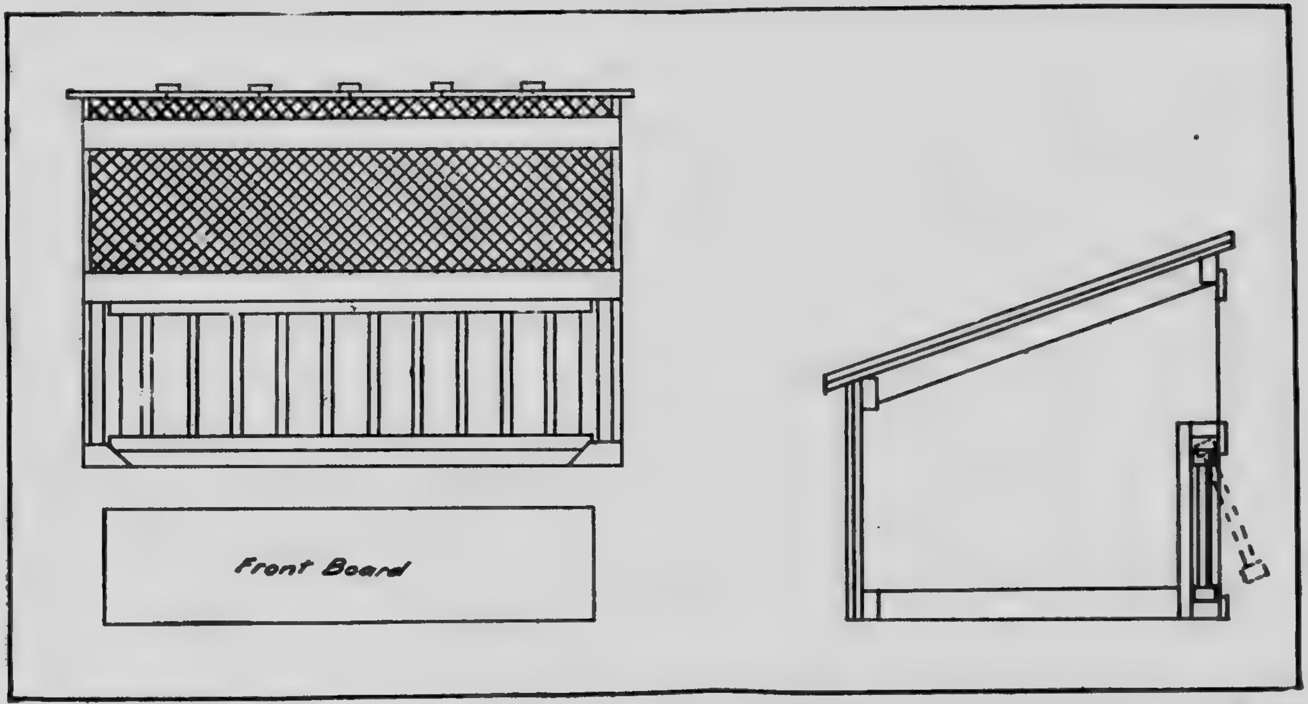

Fig. 7. Sketch of first-class hen or "A" coop. The wire at top admits sufficient fresh air, and yet it is not too cool for any but very severe weather. Early in spring it is advisable to set the coop on a board bottom, detached from the coop to allow of easy cleaning. When no bottom is used, the coop should be either moved forward or to one side, never backwards, because of the danger from feeding chicks amongst filth. A little air-slaked lime should be sprinkled over portion of soil used.

BROODING.

One of the main things in brooding is the temperature. The chicks' lungs are located along the spinal column and are not protected very well anatomically. They have a thin membranous lining over them over which a few feathers grow. This is very meagre protection, so meagre that the lungs may become readily chilled, or readily overheated. Then an even temperature, with as few variations as possible is most desirable. On the other hand, the "fireless" brooder is being used with success by many poultrymen in different parts of the Province. It should not be taken up too readily by amateurs. Artificial heat may be supplied the chicks for the first week or ten days, and then the "fireless" system may be found to carry them through for the remainder of the brooding season.

Fig. 8. Four-compartment setting-coop. After hatching can be made into one broody-coop.

FEEDING.

Some good commercial "chick-feed" is good to start them on, and after they learn to scratch they can be fed dry mash from a hopper. The drier the food for the first few days the better. The dry mash should not be given them all at once, rather let them have a little from time to time, as in this way they will become accustomed to it gradually, and will not overeat. A good mash may be composed of wheat, bran, shorts, oatmeal, corn-meal, equal parts by measure, and from 5 to 10 per cent. beef-scraps. The beef-scraps will go towards the formation of bone, which is so essential in the development of the chicken. Another excellent food which serves the same purpose is skim-milk, sour milk or buttermilk. Where this is obtainable beef-scrap is not necessary. Green food in some form is necessary. It is surprising what large quantities of green food little chicks will consume. Lettuce, lawn-clippings, clover, rape, alfalfa, cabbage, mangels, and kale are relished. Charcoal, fine grit, and oyster-shells are other requisites for the growing chicks.

The premises should be kept in the most sanitary condition and the food should also be kept sweet and clean. Sanitation is one of the most important factors in the poultry industry, and the most careful consideration should be given while the chicks are young.

FEEDING THE GROWING STOCK.

All of the chicks are usually in the same flock until about ten or twelve weeks old. About this time the cockerels are separated from the pullets, and all cull pullets which would not develop into suitable breeders are taken out. Different methods of feeding should be employed with the broilers, those intended for roasters, and the females which are being kept for laying and breeding purposes. On all poultry plants there is always a certain number of male birds to be disposed of. With the lighter breeds it is most profitable to sell the cockerels as broilers, while with the heavier breeds it may be as well to hold them, and later make roasters of them. The method of feeding the broilers, roasters, or capons would not vary much.

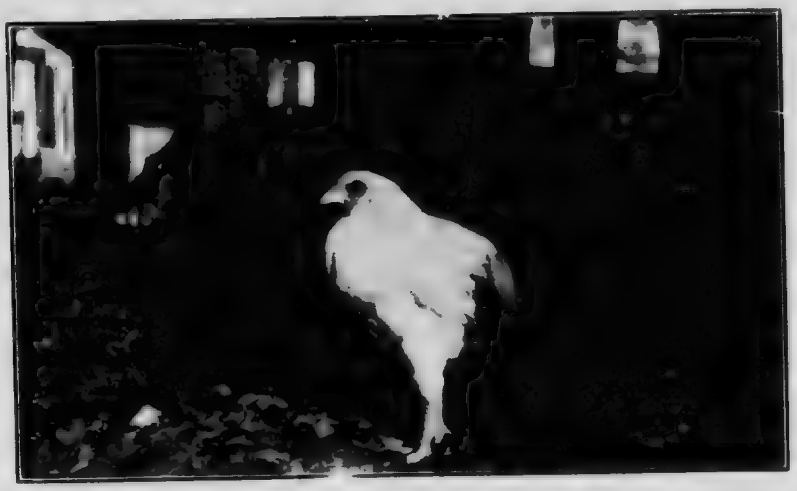

Fig. 9. Too often such specimens as above are seen on poultry-ranches in the Province. As soon as noticed, such chicks should be killed and burnt.

The principal object is to secure as rapid flesh development as possible. A chicken ten or twelve weeks old will not tend to fatten very rapidly, but if penned up and fed heavily for a few days will add considerably to its weight. Those intended for roasters should develop as large frames as possible, so that when they become full-grown they will put on plenty of flesh.

A wet mash fed occasionally tends to give quick growth. Variety should be used the principal grains being wheat, corn, and oats. A mash composed of two parts corn-meal, two parts middlings, two parts beef-scraps, one part bran, and one part ground oats may be used. This may be moistened with skim-milk or buttermilk, and fed once or twice a day. Different ground grains may be used, but the important thing is to have a forcing mash. Broilers may be sold as squabs when weighing from 12 oz. to 1 lb., or held a few weeks longer, when they weigh about 2 lb.

FEEDING THE ROASTERS.

There is a great scarcity of properly dressed poultry on the markets of the Province. The broiler trade is developing and roasters are in great demand, also dressed turkeys, ducks, and geese. Prices for all forms of dressed poultry are exceptionally good.

In fowls to be fattened for roasters the first point we should look for is a good constitution in order that they may be fattened early and economically. A good market bird should have much the same characteristics as a choice beef animal. It should be fairly low set, broad-breasted, and, as a rule, should be rather short in the bill, bright in the eye, broad in the head, with legs set wide apart.

Crate fattening is more economical than pen fattening, although the latter practice is often resorted to because of the lack of proper facilities for crate fattening. Birds fattened in crates, if properly fed, will be ready for market in about two to three weeks after being put in the crates. A very easily made and efficient fattening-crate can be made of laths, and a few light boards which are used for ends and partitions. The crate should be 6 feet 6 inches long, 16 inches high, and 16 inches wide. The top, back, and bottom are formed of laths, running lengthwise. The laths on the top and back should be about 1⅛ inches apart. The slats on the front run up and down and are placed about 2 inches apart, so that the birds may eat from the V-shaped trough in front of the crate. The laths on the bottom are usually placed ¾ inch apart. Care should be taken to have the back slat on the bottom at least ¾ to 1 inch from the back, so that the droppings may pass through and not accumulate. Even better still, the bottom of the crate can be made of ½-inch wire mesh.

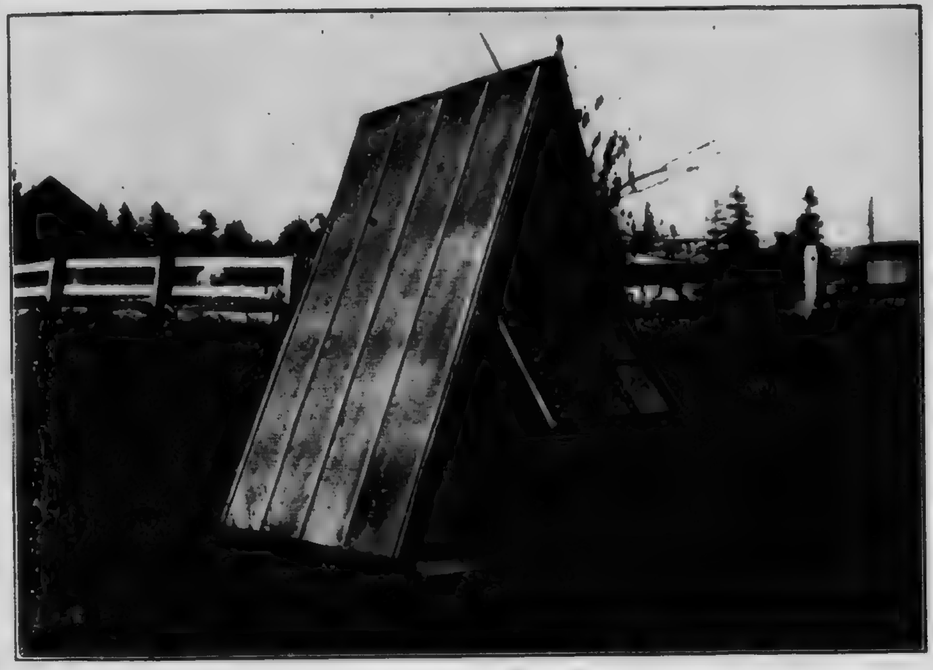

Fig. 10. A-shape colony house, suitable for growing stock. The writer has found that this type of house affords too much surface to the sun's rays during the day. However, when placed under trees, it is satisfactory.

A V-shaped trough, 2 inches deep and 2½ inches wide at the top, inside measurements, is placed in front of the crate on brackets, the trough being raised about 2 inches from the level of the bottom of the crate. The crate when finished should stand on legs about 2½ to 3 feet high, and should be protected from the sun.

For the first few days after the birds are placed in the fattening-crate they should not be fed too heavily. The success of fattening depends to a large extent upon the feeding of the birds for the first few days. The crops should never be too well filled as the appetites should be kept keen. If this method is practised, it will be found that the birds will feed better throughout the fattening period than if fed too heavily at first. No more food should be given at any time than the birds will eat up clean. If all food is not eaten the troughs should be taken away or the feed removed, and the troughs turned over. Feeds should be, if possible, twelve hours apart, and the food should be mixed at least twelve hours before feeding.

The following are good mashes which may be used for fattening:—

(1.) Two parts ground oats, one part corn-meal or ground barley, and one part low-grade flour.

(2.) Equal parts low-grade flour, barley-meal, wheat middlings, and rice-meal.

(3.) Equal parts ground oats, low-grade flour, and corn-meal.

These mashes may be mixed with buttermilk or skim-milk. Milk is an excellent food for fattening chickens, as it tends to develop the tissues and greatly improves the quality of the meat. The proportion of milk to dry mash is about double the quantity of milk by weight or measure.

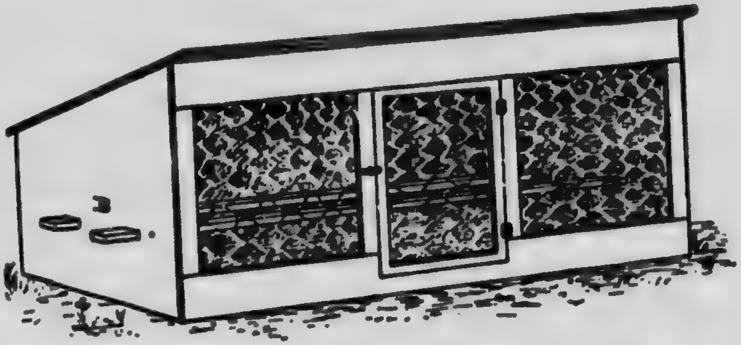

Fig. 11. B or secondary coop. Dimensions: Length, 6 feet; width, 2 feet 6 inches; height, front 2 feet 4 inches, back 18 inches. A hen's brood of chicks, at about eight weeks of age, should be placed in here from smaller quarters, or the B coop itself makes a splendid coop for hen and chicks from the start. When using the coop for this purpose, the roosts can be removed, and roost-holes in ends covered temporarily with a shingle tacked over to keep out draughts and vermin.

FEEDING THE LAYING STOCK.

As soon as possible the pullets should be placed in colony houses and allowed free range. The principal object is to have them fully matured into healthy fowls with plenty of constitutional vigour. The stamina should be kept up so that they may be able to keep in the best of health when heavy egg production is demanded of them. The health of the laying stock has a great deal to do with success in poultry-raising, for heavy egg production is principally a problem of how to maintain laying hens in a high state of health. Before any marked difference may be expected from adopting improved methods of feeding, the fowls must necessarily have plenty of constitutional vigour, with inherited stamina. They must be supplied with an abundance of fresh air, day and night, and must also be induced to take plenty of exercise.

The hen is simply a manufacturer, manufacturing the raw materials, the food, into the finished product, the egg. The food serves various purposes, part of it to furnish energy to carry on the various activities of the body, and to keep the body warm; other purposes being that of building up the tissues and organs, and keeping them in repair, and to supply material for egg production. For these various purposes different classes of nutrients are demanded. The heat and energy required by a fowl are derived mainly from the fat and a number of other carbonaceous materials in the food termed carbohydrates. The organic part of the bone, the tendons, the internal organs, and the muscles in the body of a hen are derived from the nitrogenous constituents of the food, commonly termed protein. Then to give substance to the bones, and other various organs, and also for the formation of the shell of the egg, ash constituents are required. There are three classes of nutrients, carbohydrates, protein, and ash, which are used in feeding for egg production. The egg is also composed of these three classes of nutrients. Then the object in feeding is to give the hen such foods which are composed of the same constituents as the egg—for it is the egg we are after—and in as near the same proportion as possible. The nutritive ratio of a food is the proportion of digestible protein to digestible carbohydrates, and in the body of the hen and in the egg it is found to be as two to one. Now, the majority of the more staple grains have much wider nutritive ratios, which shows that they are deficient in protein. To make up this deficiency in protein, foods rich in nitrogen must be used. Speaking practically, this means that laying hens must have a variety of grain and animal food, and the better the proportion in which the grains are fed the more economically can the hen convert the food into the finished product.

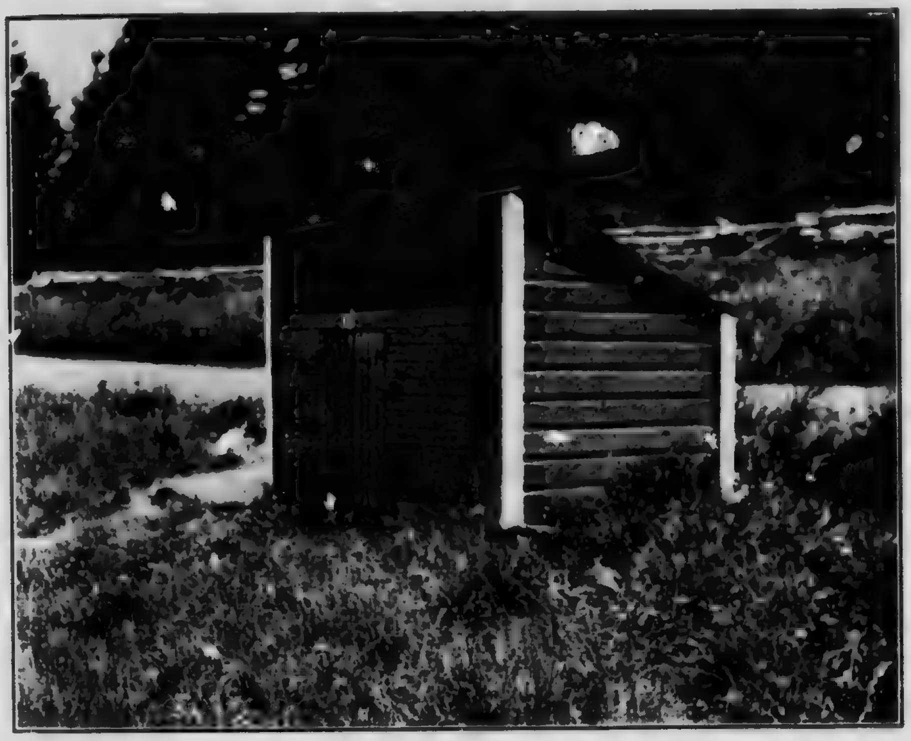

Fig. 12. This type of colony coop could be improved by having more space open in front, and lowering the opening. As depicted, the rain can obtain easy ingress and the sun's rays can only reach a very small space at the back. Would place wire door in front, fitted with muslin-cloth frame.

ANALYSIS OF POULTRY FOODSTUFFS.

Food.	Total Dry Matter in 100 lb.	Digestible Matter in each 100 lb. of the Food.		
		Proteins.	Carbohydrates.	Fat.
	Per Cent.	Per Cent.	Per Cent.	Per Cent.
Wheat	89.5	8.8	67.5	1.5
Oats	89.6	8.8	49.2	4.3
Corn	89.4	7.8	66.8	4.3
Barley	89.2	8.4	65.3	1.6
Peas	85.0	19.7	49.3	0.4
Buckwheat	86.6	8.1	48.2	2.4
Rice	87.6	6.4	79.2	0.4
Kafir corn	90.1	5.2	44.3	1.4
Sunflower-seed	91.4	14.8	29.7	18.2
Rye	91.3	9.5	69.4	1.2
Wheat bran	88.1	11.9	42.0	2.5
Wheat middlings	88.8	13.0	45.7	4.5
Gluten-meal	90.5	29.7	42.5	6.1
Red clover hay	84.7	7.1	37.8	1.8
Alfalfa hay	91.9	10.5	40.5	0.9
Oatmeal	92.1	11.9	65.1	6.7
Linseed-meal (old process)	90.2	30.2	32.0	6.9
Linseed-meal (new process)	91.0	31.5	35.7	2.4
Beef-scraps	89.3	66.2	...	13.4
Dried blood	91.5	70.9	...	2.5
Green bone	65.8	16.0	1.9	20.5
Skim-milk	9.4	2.9	5.3	0.3
Buttermilk	9.9	3.8	3.9	1.0
Potatoes	20.9	1.1	15.7	0.1
Mangel	9.1	1.0	5.5	0.2
Cabbage	10.0	2.3	5.9	0.1
Rape	14.3	2.0	8.2	0.2
Red clover (green)	29.2	2.9	13.6	0.7
Alfalfa (green)	28.2	3.6	12.1	0.4

Protein.—The protein is that part of the food containing nitrogen which forms the muscles (lean meat), tendons, ligaments, blood, nerves, internal organs, skin, and feathers.

Carbohydrates and Fat.—These form the starchy and fatty portion of the food, and go to produce heat, energy, and body-fat.

Laying fowls and growing pullets produce a very nitrogenous product. The importance of feeding lots of protein in the ration will be seen from the following:—

Composition of the Fresh Egg.—Water, 67.7 per cent.; protein, 12.2 per cent.; carbohydrates and fat, 8.9 per cent.; mineral matter, including shell, 12.2 per cent.

Composition of Growing Pullet.—Water, 55.5 per cent.; protein, 21.2 per cent.; carbohydrates and fat, 19.9 per cent.; mineral matter, 3.4 per cent.

Among the more staple grains are wheat, oats, barley, corn, and Kaffir corn. Wheat is one of the best grains for the poultry plant, though some poultrymen claim it to be an expensive food. However, when the net results are balanced up, poultrymen in British Columbia can readily afford to use this valuable grain. Since it is a staple of human food, the price of good wheat usually rules high as compared with other grains. Broken wheat, frozen wheat, and good wheat screenings are as good for poultry-feeding as the very finest milling wheats.

Oats make a very good poultry-food, but when poor in quality the percentage of hull is sometimes very large and such oats are not very palatable or digestible, hence should not be used. Sprouting the oats by soaking them for about twenty-four hours increases their palatability. Oatmeal or rolled oats make a good food for young chicks, and ground oats with or without the hull is excellent for fattening fowls.

Barley, like oats, has a large percentage of hull, but is a valuable food.

Corn is one of the most commonly used of all grains, especially in the great corn belts. Corn is rich in fat and forms an excellent food when used with other grains. Cracked corn is good as a chick-food, while corn-meal is a good fattening food, though it tends to produce the undesirable yellow flesh.

Besides the whole grains, there are the mashes, green foods, grits, oyster-shells, and other foods.

The dry-mash system, on the whole, is used much more than the wet-mash system. In feeding dry mash, different ground grains are used and mixed together. This mixture is kept before the fowls all of the time, in hoppers.

Some good mashes which are largely used are as follows:—

(1.) By measure, four parts bran, two middlings, two ground oats, one corn-meal, one ground barley, one-half linseed-meal, and one-half beef-scraps.

(2.) By measure, four parts bran, four ground oats, two corn-meal, one middlings, one cut alfalfa (well cured), and one part beef-scraps.

(3.) Equal parts by measure of bran, low-grade flour, barley chop or meal, and 10 per cent. beef-scrap.

(4.) By weight, two bran, one corn-meal, one middlings, one-half linseed-meal, and one-half beef-scraps.

In wet-mash feeding many by-products may be economically disposed of, though this method involves more labour, especially with large flocks, than dry-mash feeding. Small potatoes or other refuse may be boiled and mixed with the mash and fed. Probably the best time to feed a wet mash is at noon.

The following makes a good mash: Bran, shorts, ground oats, corn-meal, 10 per cent. beef-scraps, and green food, such as clover or alfalfa. Soak the alfalfa-meal over night in boiling water and mix with mash next afternoon, then feed.

Alfalfa, clover, and cut-grass or lawn clippings are sources of green food. Mangels form one of the cheapest foods for the laying hens and are easily grown. If the flock is to produce maximum results it must be liberally supplied with nutritious food.

One of the most successful methods in feeding laying hens is to feed them some whole grain, wheat, in the early morning as the fowls come from the roosts, and at noon give them some green food, sprouted oats, and at night a good feed of corn or corn and oats is given. The whole grains should be scattered in litter 12 or 14 inches deep, as in this way the fowls are induced to take plenty of exercise. Dry mash is kept before them all the time and they are given liberal quantities of green food in the form of alfalfa or mangels. Clean water, grit, and shells are never wanting.

EGG PRODUCTION.

However careful the poultryman may be in feeding, he must not expect appreciable results unless he has good laying stock. The best strains of the proper variety should be selected. The strain of a variety is more important than the variety itself, although the variety has an important commercial aspect.

At present the average number of eggs per hen is not over seventy, but the average hen in every flock should produce at least 150 eggs per year

A poor layer is a poor payer. The unprofitable hens should be weeded out, thus saving loss in the amount of feed consumed, and at the same time giving the good layer a better show. Different methods of selection may be employed. Up to the present, trap-nesting cannot be recommended for commercial plants on account of the labour involved. Trap-nesting is followed by many poultrymen, and each hen that is being trap-nested wears a leg-band which is stamped with her number. A record is kept of the number of eggs she lays, and by this method the unprofitable hen may be weeded out. It requires considerable time in keeping the record and in releasing the birds from the nest, though it has many distinct advantages. In the hands of those who understand the principles which must be kept in view, this system is an excellent one. It needs to be very carefully applied. Some breeders test the laying qualities of their hens by means of the pelvic-bone test. If this test is to be satisfactory it is necessary to test the fowls during the months of November, December, and January. Any fowl showing good width between the pelvic bones during these months can generally be relied upon to do her share in filling the egg-basket. The winter layers are, of course, the most profitable.

The thing of importance is to breed a heavy egg-laying strain that will reproduce its egg-laying characteristics in the offspring, at the same time maintaining the highest possible degree of vitality.

Finally, as we have seen, the question of egg production involves many factors. The principal problem is how to maintain the heavy-laying hens in a high state of health. Inherited stamina, fresh air, exercise, and food are necessities if constitutional vigour is to be maintained. All of these factors must be considered when endeavouring to improve the qualities of any strain of birds.

POULTRY-HOUSES.

The chief factors in poultry-house construction are the cost of the house, the comfort of the fowls, and the proper provision of light and ventilation. Expensive houses are unnecessary and often are not as convenient as they should be. The cost of the building is influenced by its shape. A square house is more economical to build than a long narrow one. For roofing, the writer prefers shingles. It costs more to house flocks in colony houses than in a continuous house. On the other hand, on the colony system the fowls are on free range, and can be fed cheaper than when they are kept in large flocks. Naturally the cost of labour is greater when fowls are kept in small flocks, yet notwithstanding the amount of labour required to do the extra work in connection with the colony plan, there are many advantages. Expense of fencing and congestion of flocks is avoided. Colony houses may be built on uncleared land and even in wooded areas, and the fowls can be hopper-fed. Where a large number of fowls are being kept the continuous house will give good results with much less labour, but proper precautions must be taken to prevent the outbreak of disease through soil contamination and filth.

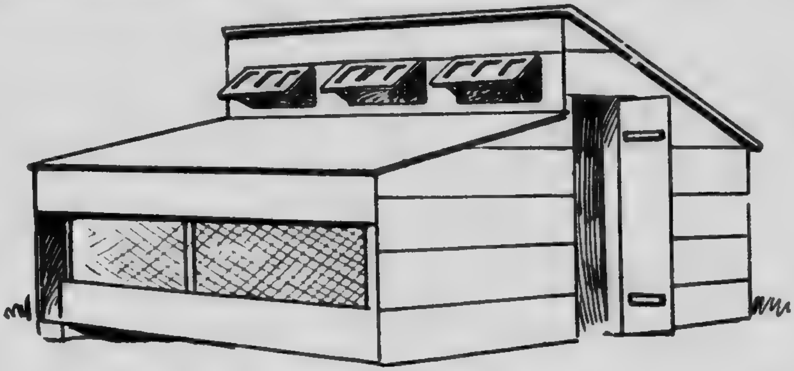

Fig. 13. Woods fresh-air house. A type of house eminently suitable for small breeding-pens or small laying flocks. Its construction—low-down front—makes it somewhat difficult and expensive to clean out when used as a long-continuous house.

It is very necessary that the house be built on a dry location, a location where there is ample drainage, and where, if possible, the subsoil is of a gravelly or open nature. The floor of the house should be somewhat elevated above the level of the land, so as to be sure of drainage. The houses should be faced to the south or south-east, with as much as possible of the front open. The house must be free from draughts at all times. Ventilation and abundance of fresh air are two of the most essential requirements in the hen-house, if the flock is to be kept in a healthy condition. The old idea that the house must, during cold weather, be shut up close and kept warm has long since died out, and it has been proven that hens give best results when allowed to run and work in the fresh air during the day. One essential factor is to have the birds roosting in comfortable quarters at night, although the air should be pure. For this reason, we do not advocate the use of a drop-curtain before the roosts, except in districts where the temperature falls to a very low degree; but we do maintain that the roosts should be so placed in the house as to avoid all danger from draughts and other detrimental influences.

Another satisfactory house is found in the "Woods" fresh-air house. (Fig. 13.) This house is of the semi-monitor top type and bears out the principle of the "Tolman" house, providing some advantages. Each section is about 7 feet deep, making the house, in all, 14 feet deep. If built on the continuous plan the partitions may be placed every 15 or 20 feet. The actual opening in front may vary in different sections of the Province. A board 10 or 12 inches wide is necessary at the bottom to prevent the fowls from scratching the litter out and also to act as a wind-break. The house is 4½ feet high in front, and where the top and bottom boards are used the actual front opening would be 2½ feet, whereas it would be 3½ feet where the top protection board is not necessary. A row of windows is placed along the top part of the back section, and this permits of the sun's rays reaching the roosting-quarters. These should be on hinges, so that they can be opened when desirable. When opened during warm weather a free circulation of air is obtained and the construction of the house provides for comfort in winter. When properly constructed it is serviceable and durable.

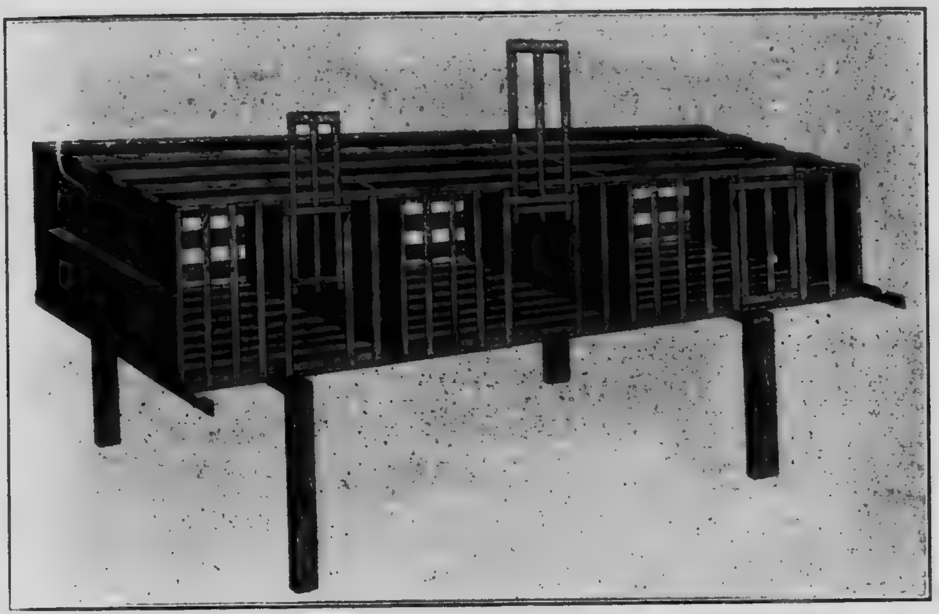

Fig. 14. A good crate for shipping market poultry.

General Requirements.

In brief, a cheaply built house with an open front will give equally as good results as, if not better than, a more expensive house. Not only will fowls lay more eggs if the house is supplied with plenty of fresh air, but the hatchability of the eggs from such houses will be greater, and a stronger and more thrifty bunch of chickens will be the result.

There are many plans of houses which receive a wide use, and no one can truthfully say one plan is the best. The house must suit the local conditions, but it is advisable to get as much sunlight and fresh air into the house as possible. Interior arrangements should be simple and as convenient as possible. The nests should be up at least 2 feet from the ground, so as to give the fowl all the floor-space possible. [illegible] roosts should not be too high from the floor, or there is danger that the fowl [illegible] injure its feet in jumping from the perches to the floor. The dropping-board for a single roost should be from 18 inches to 20 inches wide, and 3 feet 6 inches wide for a double roost. Roosts may be made of 2 by 3 scantlings, and the edges may be rounded. For convenience in cleaning the dropping-board, it is well to have it fairly low down.

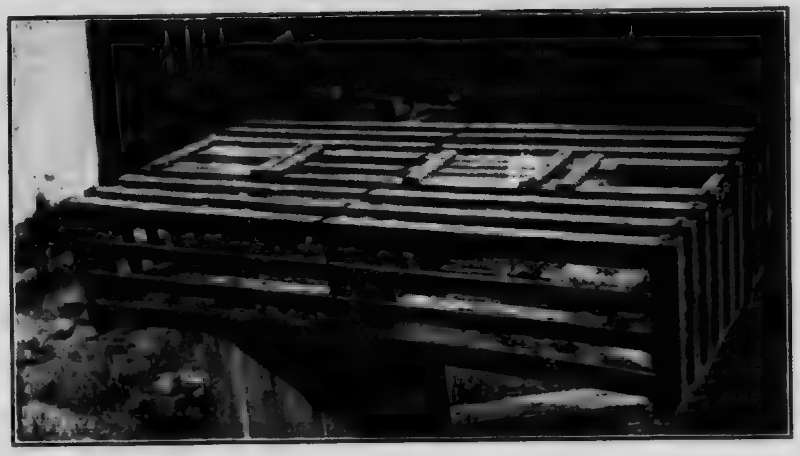

Fig. 15. A standard fattening-crate, 6½ feet long, 16 inches high, and 20 inches wide.

LITTER.

The number as well as the fertility of the eggs depends largely upon the vitality of the flock. The vitality, in turn, largely depends upon the exercise the hens are given. It is only natural for a hen to work for most of her living; consequently, the reproductive system will be better nourished than if the hen were fed large quantities of food only a few times a day and induced to take but little exercise. Exercise helps to start egg production. The litter should be quite deep, from about 8 inches to 12 inches. It should be kept in such a condition that the hens may readily scratch down to the floor, thus being able to pick up every grain that is in the litter. The fowls should keep the litter free of grain. If, some time after feeding, any grain except a few coarse oats are left in the litter, there is something wrong with the method of feeding. The flock should not be fed too heavily in the morning or throughout the day; but at night the fowls should be given all they will pick up clean. Through vigorous exercise the fowls will become hardier, and when cold weather comes on they will be better able to resist the change and will make better breeders and layers.

CLEANING THE HOUSE.

Cleanliness is one of the most important factors to be considered in the poultry industry. The house should be cleaned occasionally and the roosts painted with kerosene or some other disinfectant. The interior of the house should be whitewashed frequently, with about 5 per cent. carbolic acid used. The nests must be kept clean, since eggs readily become tainted.

MOVABLE HOUSES.

Conditions in this Province are quite favourable for the use of movable houses. The most satisfactory house is one built on runners, so that the house may be moved with a horse or team. Movable houses are used principally for growing stock and breeders. They may be drawn from place to place over the farm, giving the fowls new ground. Stump lands and orchards are excellent fields for poultry. Usually some form of open-front house is used.

POULTRY-RUNS.

For success with poultry, they should not be allowed to run year after year on the same land without soil being turned over and a green crop sown occasionally. It cannot be too strongly emphasized that some form of soil-cultivation should be linked with the poultry industry. It has been proven that many diseases which break out in the flock arise from a contaminated soil. On commercial plants the whole plant may be divided into two parts by one wire fence running through about the centre of the plant. This will allow of the cultivation of one part and the sowing of some crop while the fowls have the range of the other part. The land should be top-dressed with lime frequently and a solution of sulphuric acid may be used. Keeping the soil free from contamination has a great deal to do with the success of the industry. Wherever possible, shade should be provided in the runs. Fruit-trees, sun-flowers, kale, or corn is excellent.

MARKETING POULTRY PRODUCTS.

A large part of the profits in poultry-keeping depends on the marketing of the products. The poultryman must be a good salesman as well as a good raiser of poultry. He must have good markets to begin with, or know how to make them. With high-grade products that somebody wants, and that most people will not take the trouble to supply, a high-class trade can be built up through skill and tact. The nearer the producer can come to the consumer in selling his products the higher will be the price realized. The producer should strive to eliminate the middleman. There is fair profit only in producing eggs and other produce at regular market prices. The largest profits must come from superior marketing and from special market advantages in selling eggs and other produce. A special market advantage has been introduced into British Columbia at several points, where co-operative egg stations have been established.

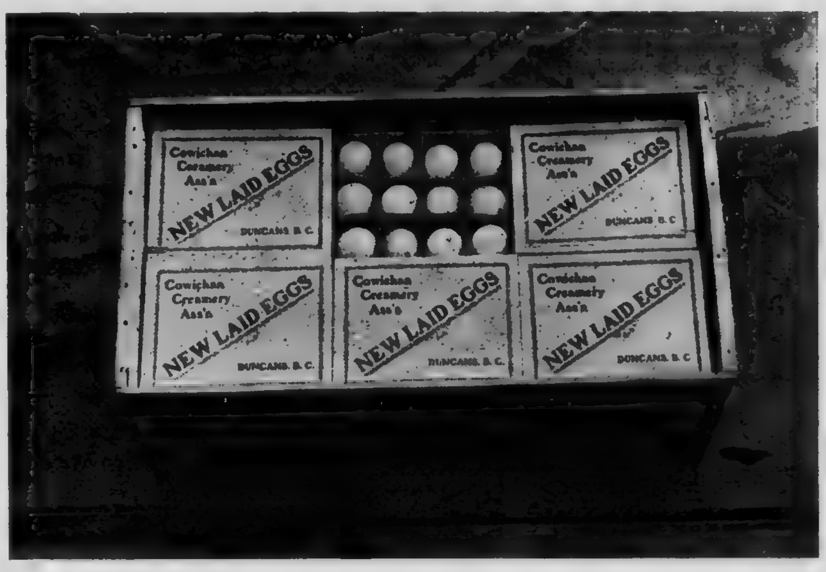

Fig. 16. A method sometimes employed when shipping high-grade eggs in large consignments.

MARKETING EGGS.

Fig. 18 shows eggs from a leading grocery-store. The eggs were in no way selected. Dirty eggs are in evidence. Poultrymen should never send dirty eggs to the market. The shells of the eggs are very porous and allow gases and bacteria to enter the egg. If the egg is laid in filthy nests or is packed in unclean cases, it soon becomes tainted and unfit for use.

The egg is at its best when just laid, and the longer it takes to place it in the consumer's hands, the less it is worth. Eggs, when prepared for market, should be spotlessly clean. They should be packed in clean cases, of which the thirty-dozen size is preferable. Absolutely clean fillers and cardboards should be used. The quality of the eggs should be unquestionable. It is only in this way that a good trade can be worked up.

The egg industry in Denmark has been enormously improved owing to the application of the principle of co-operation to the collecting, grading, packing, and export of the eggs. The great progress of Denmark during the past fifty years may be at once attributed to the wonderful system of education available for its people, and to the extent to which the principle of co-operation has been adopted in every part of the country and in every phase of its national industry.

At present thousands of dollars are lost annually in British Columbia through bad eggs. Consequently, it is of vital importance that the poultrymen throughout British Columbia produce sufficient quantities to supply the home trade; and, finally, to solve this vital problem, we must have, first, a campaign of education among egg-producers; and, second, a system of buying eggs that will guarantee a price according to quality.

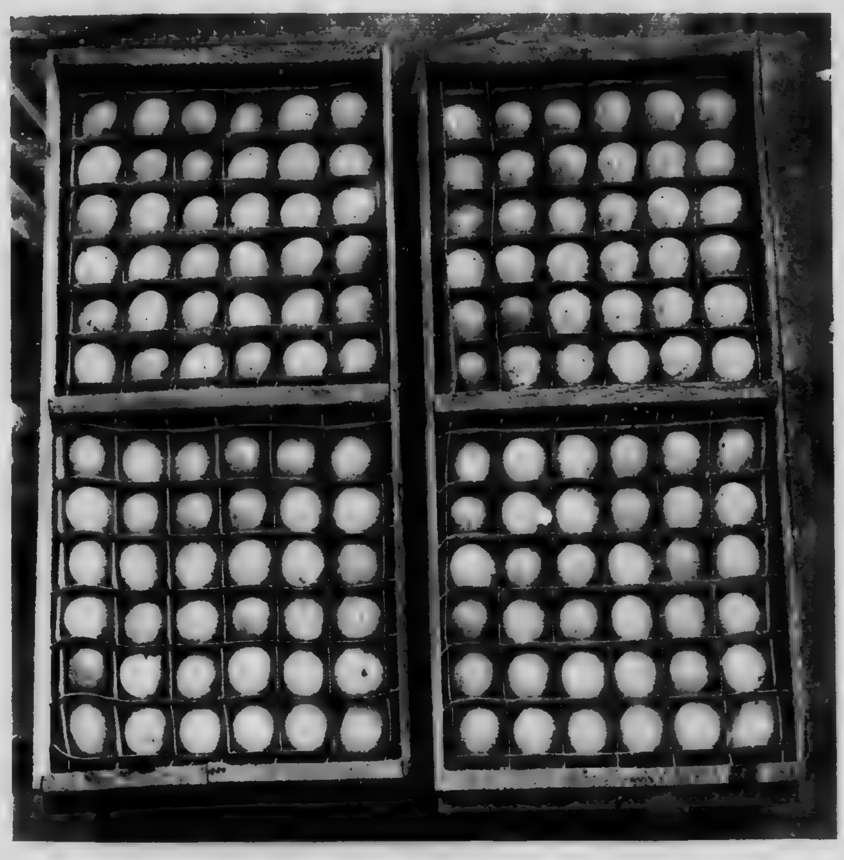

Fig. 17. Thirty-dozen egg-crates, as commonly used in the Province. When eggs are kept for any length of time in these crates, it is important to see that the cardboard fillers or partitions are dry and clean. Mouldy or damp fillers will cause the eggs to deteriorate very quickly.

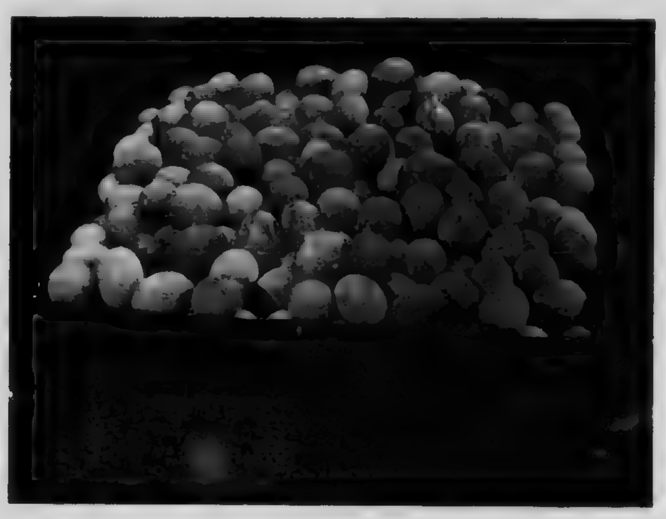

Fig. 18. Basket of eggs as generally exhibited in stores—all ages, all sizes, all colours, clean, dirty, cracked, and broken. A basket of fertile eggs placed in the run for about six hours at a temperature exceeding 70 degrees will start hatching. Eggs for sale should be kept in shaded parts of store or dry cellar, and cards inserted in window announcing the fact.

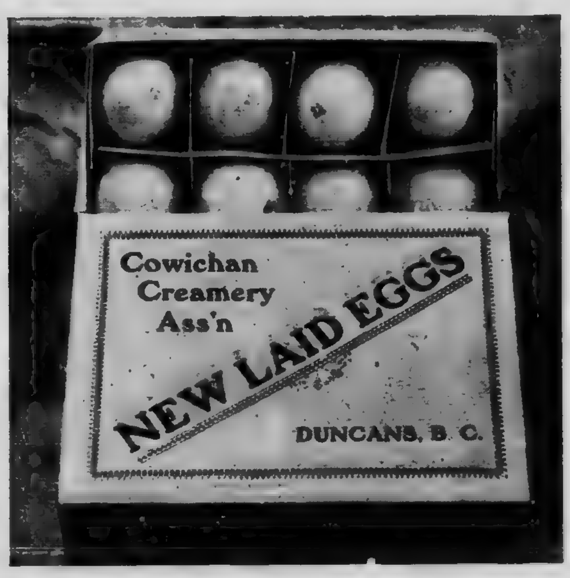

Fig. 19. One-dozen cartons. These are of cardboard and cost in some localities from $12 to $16 per thousand, the latter price including printing.

MARKETING DRESSED POULTRY.

The same principles hold good for dressed poultry as for eggs. A little care and skill in preparing poultry for market will often make a large increase in the selling price. The expense of killing, picking, and packing poultry is small in comparison with the first cost of raising. All poultry should be carefully assorted according to size, colour of shanks, age, and condition. Each case should be uniform in quality.

***Market Requirements.*—Fattened chickens when prepared for the consumer should conform to the following market requirements:—**

The dressed chicken should present a neat, clean, plump appearance.

The preferable weight is about 4 lb. Plump, crate-fed chickens up to the weight of 5 lb. are more readily disposed of than heavier ones.

The shape of the breast should be long and broad, to give a well-meated appearance.

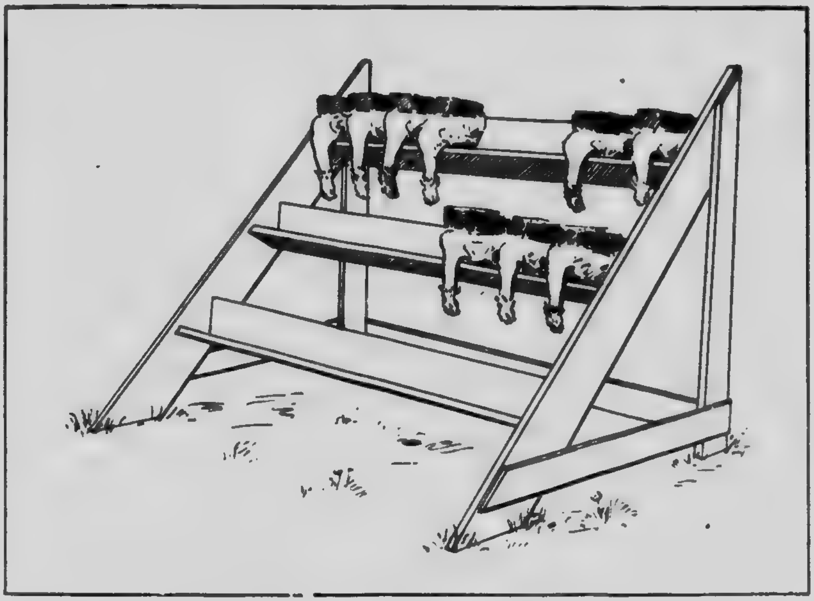

Fig. 20. Illustration of shaper in frame.

The legs should be as short as possible, indicating the low, blocky type.

The colour of the flesh should be white and the grain fine.

The minimum of bone and offal are two important factors in the best grade of marketable products.

Do not market lean chickens. It is an unprofitable business both to the producer and the consumer.

Killing, Plucking, and Packing.—Before killing, the birds should be fasted at least from twelve to eighteen hours, which will prevent food remaining in the crop and the intestines which would decompose and spoil the flavour of the meat. Several hours after the last feed allow the birds all the clean water they want, and then give them a complete fast until killed. The best method of killing is to stick the bird in the mouth, braining it, and at the same time bleeding the bird by cutting the arteries.

Plucking should be commenced at once, pulling the body-feathers first, then the wing and tail-feathers. As soon as the fowl is rough-picked the pin-feathering and finishing can be done more quickly in a sitting position.

Returns are greater when shipped in a compact, plump condition than in a rough, unprepared condition. All birds for market should be properly shaped.

The shaper is shown in Fig. 20, and is made by nailing two ⅞- x 6-inch plain boards together at right angles. The trough should be nailed into a frame and inclined slightly backwards, as shown in Fig. 21.

With legs placed alongside the breast and with the breast downward, force the bird into the angle of the shaper, cover with paper and lay a brick on the back and one against it, to hold it in position. The shaping should be done in as cool a temperature as possible without freezing, and should be continued for about twelve hours. When thoroughly cooled the birds are placed in shipping-cases, as shown in Fig. 22. Cases of basswood or spruce, with corners lock-jointed, are most satisfactory. The box should be lined with parchment paper.

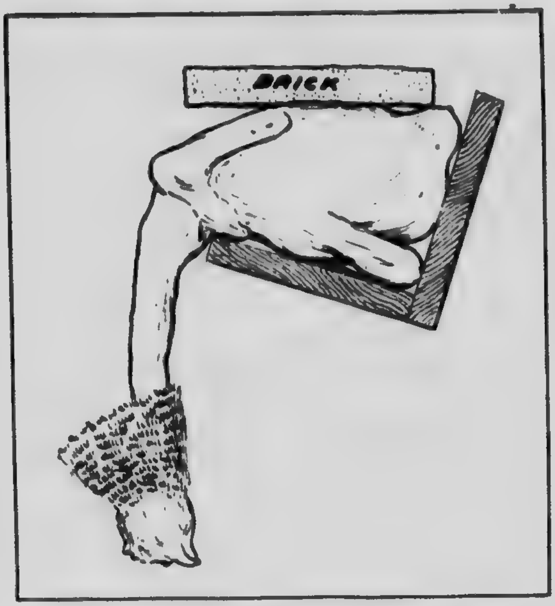

Fig. 21. Showing fowl in shaper. Should weights be used to compress bird, it is advisable to place clean paper next to flesh. Dressed fowls should not be shipped until all animal heat has escaped. Warm fowls will show blackened or green flesh upon unpacking after a short journey during hot weather.

There are different methods of packing. The general method employed in shipments into British Columbia from the East is by packing the birds in a single row. Packing the birds in two rows is employed for short shipping distances. The case should be properly stencilled, giving the name and address of producer, number and weight of birds, and whether they are chicken or fowl.

Fig. 22. Showing method of packing dressed fowls for shipment. It is important that the mouth and feet of birds should be washed or cleansed with moist rag or cloth. Filth clinging to shanks or feet will generally adhere to breast of fowl when unpacked, causing an unsightly appearance.

PESTS, PARASITES, AND DISEASES.

PESTS.

RATS.—The rat is the worst mammalian pest known to the poultryman. Its depredations everywhere result in losses amounting to thousands of dollars annually, and though thousands are killed, other thousands soon replace the slain. The most important step toward the suppression of the rat is to adopt some method to prevent it from increasing in numbers so rapidly. Restricted supplies of food means fewer rats. Their bill of fare includes seeds and grass of all kinds, flour, meal, eggs, chicks, young turkeys, ducklings, goslings, and other foods. It has been found that it costs at least 25 cents every year to feed one rat, and this on the cheaper foods alone. The failure of efforts to exterminate this rodent has not been due to lack of effective methods so much as to negligence and the absence of concerted action.

The more important means of fighting rats are: (1) Natural enemies of the rat; (2) rat-proof construction of buildings; (3) keeping food from rats; (4) driving away rats; (5) destroying rats. Trapping, if persistently followed, is one of the most effective ways of destroying rats. Another method is by the use of strychnine sulphate. The dry crystals may be inserted in small pieces of raw meat or toasted cheese, and these placed in rat runs and burrows.

The following method is recommended for poisoning rats where the rats are among chickens: Take two wooden boxes, one larger than the other, and each having two or more holes in the sides large enough to admit rats. The poisoned bait should be placed on the bottom and near the middle of the smaller box, and the larger box should then be inverted over the other. Rats have thus free access to the bait, but fowls are excluded.

HAWKS, CROWS, ETC.—In some parts of the Province it is almost impossible to raise poultry without very heavy losses, because of the depredation of these birds. An ordinary mink-trap (rusty ones are best) placed on top of a pole at least 15 feet high, and securely chained, will help to rid the flocks of these enemies. The trap need not be baited. Festoons of tape or white strings strung across rearing-yards near the coops and second-hand fish-nets have proven very satisfactory in warding off birds of prey. Poisoned infertile or worthless eggs, placed out in a field frequented by crows, skunks, mink, etc., are also successful remedies. Crystallized form of strychnine is one of the best poisons to use. The eggs should be placed in the soil large end up, and the top removed, and a few crystals of the poison inserted and mixed with the contents of egg. These should be placed out overnight, and removed before chicks are released in the morning.

PARASITES.

LICE.—Lice probably exist in small numbers wherever there are fowls, but as long as fowls are healthy and active lice cannot increase rapidly enough to seriously annoy the birds. They can only become troublesome from gross neglect, either of the fowls or of their habitations. In the one case the remedy is some good common insecticide placed in the dust-bath, which may be mixed powdered tobacco or a little powdered sulphur; in the other an energetic lime-washing of the houses and interior arrangements, with a free use of a solution of carbolic acid.

Lice in the poultry-houses and on the fowls means loss of money through decreased egg production. The interior arrangements of the houses should be simple and convenient, so that spraying and disinfecting may be easily done, giving as little chance as possible for vermin to increase.

SCALY LEG.—This is caused by a mite which burrows under the scales of the feet and shanks. Wash every morning with strong carbolic soap, after soaking bird's legs in warm water for at least ten minutes on the first day, and apply sulphur ointment or carbolised vaseline at night.

DISEASES.

Disease does more injury than any other factor. "Prevention of disease" should be the motto for the poultryman. Fresh air, abundance of sunlight, clean water, and clean quarters are necessary for success. The poultryman should watch his flock carefully, and on noting the first symptoms of sickness among any of his birds should at once remove that bird to quarters where it cannot come in contact with any healthy birds. This bird should be treated according to the disease. The general remedy for all such birds is to slaughter them, and the carcass to be burned, not buried. Neither does one gain anything by trying to cure deformed or diseased chicks.

COLDS.

Colds affect fowls variously, and if neglected often lead to something serious Changeable weather and continuous damp weather often make colds epidemic in the early fall. A common cause of colds and distempers is closing the houses too close at night. Often colds will be spread among young pullets by bringing them in from the range to close, dark buildings.

Simple remedies should be used at once; give aconite in the drinking-water. A good remedy to keep on hand for colds is equal parts of cayenne pepper, ginger, and mustard, mixed as stiff as possible in lard, then flour worked in to make a stiff dough. Form in small pellets and give by opening the mouth and dropping down the throat. Disinfect drinking-water by means of permanganate of potash. Feed all sick, especially roupy, fowls on soft feed, and see that Epsom salts are given every second day—½ teaspoonful being ordinary dose for adult fowls.

WHITE DIARRHOEA.

At present information pertaining to white diarrhœa is rather indefinite; the latest investigations disclose two diseases under the one name, "Diarrhœa." The case characterized by cheesy foci in the lungs are caused by the mould *Aspergillus fumigatus*. The cases characterized by distended and cheesy cæca invariably show the presence of coccidia. This disease is receiving a great deal of attention from poultrymen and scientists in the East, though it seems to be on the increase in this Province. The health of the flock and the cleanliness of the incubation quarters will determine to a large degree the prevalence (or not) of this disease. The soil should never be allowed to become contaminated.

EGG-BOUND.

Treatment is rarely successful. Give dose of castor-oil, wash the vent with warm water and pass in a feather dipped in sweet oil, or hold hen over a pail of boiling water for about twenty minutes.

GAPES.

This is caused by gape-worms in the windpipe, which finally kill by either wasting or actual suffocation. Place the birds in a large box covered with a coarse cloth and dust air-slaked lime on the cloth. The lime breathed in by the birds causes the worms to relax their hold and they are coughed up. Destroy the worms by burning.

LEG-WEAKNESS.

In chicks it is often due to excessive heat in brooder, and through chicks being kept indoors too much during the first few weeks. In mature stock it is generally due to forcing or to lack of bone-forming material. To cure very valuable birds they should be placed in clean dry quarters, and fed on soft food only. The mash should be mixed with the juice of lemons. Discontinue high feeding, giving more green food, fresh air, and where board floors are used, place several inches of earth on, and then scatter litter on this.

"BLACK-HEAD" OR "ENTERO-HEPATITIS."

"Black-head" has been found in chickens, ducks, and turkeys as well as other birds, but is most fatal to turkeys. Many flocks have been killed off through the ravages of this disease. The nature [illegible] the disease makes it very difficult of eradication since the disease may [illegible] a very advanced stage before any noticeable symptoms are exhibited. The victim then begins to mope about with drooping wings and lowered head. It may die very shortly or it may linger on for a long time. Naturally the head is discoloured and the bird presents a very unhealthy appearance. The disease was first called infectious entero-hepatitis, and it has been found to be due to a minute parasite called *Amœba meleagridis* or the ameba of the turkey. Of late, however the parasite is claimed to be a Coccidia. The disease begins in the cæca and generally affects both organs. Once in the tissues the organisms multiply rapidly. The wall of the affected cæcum is thickened and the inflammation may extend to other organs of the body. Associated with this condition of the cæca, there is in nearly all cases a serious disease of the liver. The liver is very much enlarged, and over its surface yellow spots appear, usually being slightly depressed below the surface. In the liver the parasites begin to multiply and spread in all directions.

During the course of affection the parasites multiply in the cæca and become mixed with the intestinal contents, many of them being discharged with the contents. This gives rise to a rapid spread of the disease. The food especially, where the turkeys are continually fed in the same place, becomes contaminated, and healthy birds devour the parasites which pass through the digestive canal into the cæca where they multiply.

Treatment of diseased birds is useless. The most obvious precaution is immediate isolation of affected birds. All dead birds should be burned and the greatest care should be exercised to prevent the spread of the disease to healthy birds. Yards and houses which have been exposed to "black-head" should be thoroughly disinfected. Poults should be raised on entirely new ground, the old ground having been sprinkled with lime and ploughed. Where the disease is present the whole flock should be killed and burned, and no more turkeys should be raised for a few years. It is next to impossible to rear chickens, ducks, or turkeys together satisfactorily. Sooner or later the turkeys will suffer.

TUBERCULOSIS.

Tuberculosis in fowls is a more serious disease than poultrymen realize. The disease exists extensively among poultry in the Province, but seldom kills enough fowls at any one time to excite the alarm of the poultryman. The peculiar nature of the disease and its method of infection greatly increases the necessity for preventive measures being taken.

There seems to be no noticeable symptoms until the disease has progressed far enough to cause emaciation or weakness, lameness often occurs, and the fowls usually begin to lose weight. In the last stages of the disease, the affected bird crouches, apparently from weakness. The comb becomes pale, the feathers ruffled, and in some stages of the disease some fowls may show tuberculosis nodules on the skin of various parts of the body. Frequently these nodules appear on the skin of the face and throat. The liver is nearly always affected, being studded with cheesy spots throughout. The spleen may be affected to such an extent that it is abnormally enlarged. The peritoneum or serous membrane of the abdominal cavity may be covered with tubercules the size of a pin-head or smaller, and when this occurs the abdomen contains more or less liquid. The intestinal walls are often thickened or ulcerated, and contain tubercules of various sizes. As with "black-head" and enteritis (a very common disease amongst poultry and often mistaken for "black-head" or tuberculosis) tuberculous fowls pass manure of a greenish cast, turning to a yellowish diarrhœa as the case becomes chronic. Such manure is very contagious, and should be cleaned up and burned.

Tuberculosis of birds is caused by a bacillus, *Bacillus tuberculosis*. There is no known remedy for this disease. Eradication from infected premises can only be attempted with fair prospects of success when all the birds are affected. Any birds that are preserved are liable to have ulceration of the intestines from which the bacilli are constantly distributed. Consequently there should be no attempt to save any birds from an infected flock. The disease must be controlled by measures designed to keep the healthy fowls separated from the diseased ones. All affected birds should be removed immediately from the rest of the flock, and should be killed at once, the bodies being burned.

The further spread of the disease through a flock where it already exists may be impeded by sanitary measures. The roosting-houses should be cleaned and disinfected as often as practicable. As with human beings, the disease can be avoided by means of good house ventilation, direct sunlight, and good wholesome food.

ROUP.

Roup may be expected to cause trouble, especially where the houses are of the closed type. A few years ago it was the most prevalent disease in Eastern Canada, but by the introduction of the fresh-air house, it has been controlled to a very large extent. It causes very little, if any, trouble on Vancouver Island, but it must be carefully watched and guarded against in some sections of the Province where there is a considerable rainfall. It is particularly prevalent in the fall and spring of the year. Do not allow the fowls to catch cold under any consideration, but keep them dry and comfortable and they will give good returns.

In the majority of cases the first symptoms appear in the nostrils, while sometimes it may be localised in the eyes. It usually appears first in weak fowls as catarrh of the nose. A serous fluid may be observed at one or both nostrils. This secretion soon becomes streaked with grey; a slimy matter forms and dries quickly to dirty crusts, which often completely close the nostrils. The secretion decomposes and emits an offensive odour from the diseased membranes of the nostrils. The inflammation easily spreads to the mucous membrane of the mouth, pharynx, and larynx; yet those parts may be the first seat of the infection. When the disease affects the eyes there is often formed in the inner corner of the eye a viscous secretion. Soon the secretion is changed into a firm, smooth, yellowish-white, cheese-like body, which fills up the whole eye. This cheesy mass may be easily removed, but the eye is soon completely filled again. Swellings occur in the membrane of the eye, mouth, and larynx; oftentimes the cheesy mass develops in the mouth, forcing the mandibles apart so that the bird is unable to eat or drink. The fowls thus infected become weak, separate themselves from the other birds, and sit around with the head drawn close to the body. The eyes are kept shut; in fact, in many cases the cheesy matter fills the eye, destroying the sight. The head is sometimes drawn under the wings so that the feathers are smeared with secretions and some fall out. Usually the birds die, though they may live in this apathetic condition for a long time.

Healthy fowls may become affected if the diseased ones are allowed to run with them. It is usually brought into the flock by a diseased fowl from another place or the bacteria transmitted from one flock to another by means of person's clothing, coops, etc.

Poultry-keepers know how predisposed chickens and all other fowls are to colds caused by sudden changes in the weather. They must be kept in as natural a condition as possible; hence the wisdom of the adoption of the fresh-air house.

Experienced practical poultrymen do not doctor fowls which have roup; they kill and burn them.

A simple and fairly efficient remedy is swabbing the nostrils and throat out twice a day with a feather which has been dipped in coal-oil. The same feather should not be used more than once. Epsom salts should be given ½ teaspoonful to each affected bird and the bird fed on soft food entirely. A quinine capsule O size should be given every two days.

It will be seen, then, that the majority of poultry diseases arise through negligence on the part of the poultrymen. Health is the normal condition for a fowl, and it is of more importance to know how to keep fowls in good health than it is to know how to cure them after they become sick. However, under the best conditions sickness sometimes may visit the flocks. It is then important to know what is the cause of the sickness, and how to remove the source of trouble.

OVARIAN TROUBLE.

This disease appears amongst fowls of heavy laying strains quite frequently, more especially Leghorns, Minorcas, Anconas, and Campines, or what are known as the egg breeds. Forcing food, with little exercise, is the most predisposing cause. Little can be done for affected fowls, as it is almost impossible to get them back into good laying condition again. This disease is more prevalent amongst young pullets than mature fowls.

WORMS.

Considerable losses have been experienced through the ravages of intestinal worms. This trouble is much more prevalent in the Province than is supposed. There are the three kinds—the tape, round, and thread worms. These attack both young and old fowls, producing emaciation, which is oftentimes mistaken for tuberculosis. Other symptoms are diarrhœal discharges of a light-yellowish colour, and quite frothy. The manure of affected fowls often contains segments of the tapeworm, and the other worms are generally passed whole. These are eaten by healthy fowls and the trouble quickly spreads.

Various remedies are recommended, the most efficacious probably being Epsom salts and spirits of turpentine. The affected fowls should be isolated, starved for a day, but allowed drinking water. About ½ teaspoonful of Epsom salts should then be given, and this followed a few hours after by 5 or 10 drops of turpentine in a teaspoonful of sweet or olive oil. The droppings should be burned and coops immediately disinfected. The doctored birds should then be fed on moist food for a day or two.

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